United States Department of Agriculture

Forest Service

Reply to 3460 Technical Assistance

Date February 21, 1986

Subject Forest Pest Problems in the Tionesta Scenic Area

To: Forest Supervisor,
Allegheny National Forest

We have prepared the enclosed report in response to your earlier request for information about the potential forest pest problems which tornado blowdown would pose for the Tionesta Scenic Area and surrounding undamaged timber stands.

Preparation of this report was somewhat delayed by the work associated with converting all the individual stand measurements of timber volumes by species and component types.

We believe that the information contained in the enclosed report would be valuable to other portions of the tornado blowdown area where an understanding of the forest insects likely to attack the damaged trees within the first year is needed. Forest insects invading the damaged trees during the second and subsequent years will be different than those during the first year, and are likely to invade the heartwood and cause even more degrade to the sawtimber component of the stand.

Forest disease problems are considered to be minimal and were not discussed.

Essentially we see little need to conduct any salvage of damaged hardwoods within the Tionesta Scenic Area, because the timber nearby does not appear threatened and significant degrade to the blowdown has already occurred.

Allan T. Bullard

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Field Representative
Forest Pest Management

Encl.

cc: FPM, AO
Sheffield RD, Attn: District Ranger
Ridgway RD, Attn: District Ranger
R-9, TM, Attn: Van Aken

Potential Forest Pest Problems in the Tionesta Scenic Area Resulting from Tornado Blowdown

by

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SUMMARY

Tornado damage to the timber stands of the Tionesta Scenic Area was evaluted for potential forest insect problems both within the Scenic Area and in adjoining timber compartments using cruise data for salvage sales and TIMIS.

There is a significant difference in the species and size class composition of the blowdown from that of the standing timber nearby. Because of this difference, the forest insects which are most likely to build up to damaging population densities within the blowdown in 1986 would not have a high potential for causing damage to nearby standing trees. Insects probably already have damaged trees windthrown by the tornado to the point where their grade has been appreciably reduced. However, the majority of the volumes affected are in hemlock and American beech, rather than the higher-valued species such as black cherry, white ash and sugar maple.

For these reasons, salvage of timber within the Tionesta Scenic Area does not appear to be warranted to either protect nearby timber or prevent damage to downed timber from forest insects.

INTRODUCTION

The tornado of May 31, 1985, devastated much of the northern end of the Tionesta Scenic Area of the Allegheny National Forest. Map 1, drawn from color infrared aerial photography taken early in June 1985, shows where the tornado caused blowdown and breakage to the forest overstory trees in and around the Scenic Area.

The potential which forest pests, especially insects, pose to the timber within and adjacent to the Tionesta Scenic Area blowdown was evaluated by Forest Pest Management using timber data collected by the Timber Management Staffs of the Forest Supervisor's Office and those of the Sheffield and Ridgway Ranger Districts.

METHODS

Cruise data was collected within the tornado path on the Tionesta Scenic Area and within timber compartments immediately adjacent to this path by personnel from the Sheffield and Ridgway Ranger Districts. The tree volume data from these cruises were compiled by FPM, Morgantown, to determine the timber characteristics of species composition and general merchantibility size class (sawtimber and pulpwood) for the blowdown and for standing timber nearby.

The insect species which possess the greatest potential for breeding in the blowdown and developing large populations which could move to adjacent standing trees were determined. Background information was gathered on the habits, food requirements and management options for each of these insects.

RESULTS AND DISCUSSION

CHARACTERISTICS OF TIMBER STANDS

The species of trees both blown down by the tornado on the Tionesta Scenic Area and standing in adjoining compartments of the Sheffield and Ridgway Ranger Districts are given in Table 1. The information in this table shows the timber volumes by species from two cruises within the tornado damaged area and from two cruises outside the tornado damage area. Also, the general size classes of damaged vs. undamaged timber are indicated in terms of sawtimber and pulpwood.

From the available cruise data, it is apparent that the majority of the blowdown was comprised of hemlock and American beech, with minor components of the other species characteristic of the climax forests Northern Hardwood Forest Types which the Tionesta Scenic Area typifies. The majority of the volumes are also in the larger diameter trees as pulpwood volumes are small. By contrast, the hemlock and American beech component in the standing timber in adjoining compartments is quite low compared with larger amounts of the tree species typically found in earlier successional stages of the Northern Hardwood Forest Type, such as black cherry and red maple. Additionally, a large amount of the tree volume in standing trees outside the tornado area is made up of small, pulpwood sized trees.

Map 1. Tornado Path through the Allegheny National Forest
Sheffield Ranger District

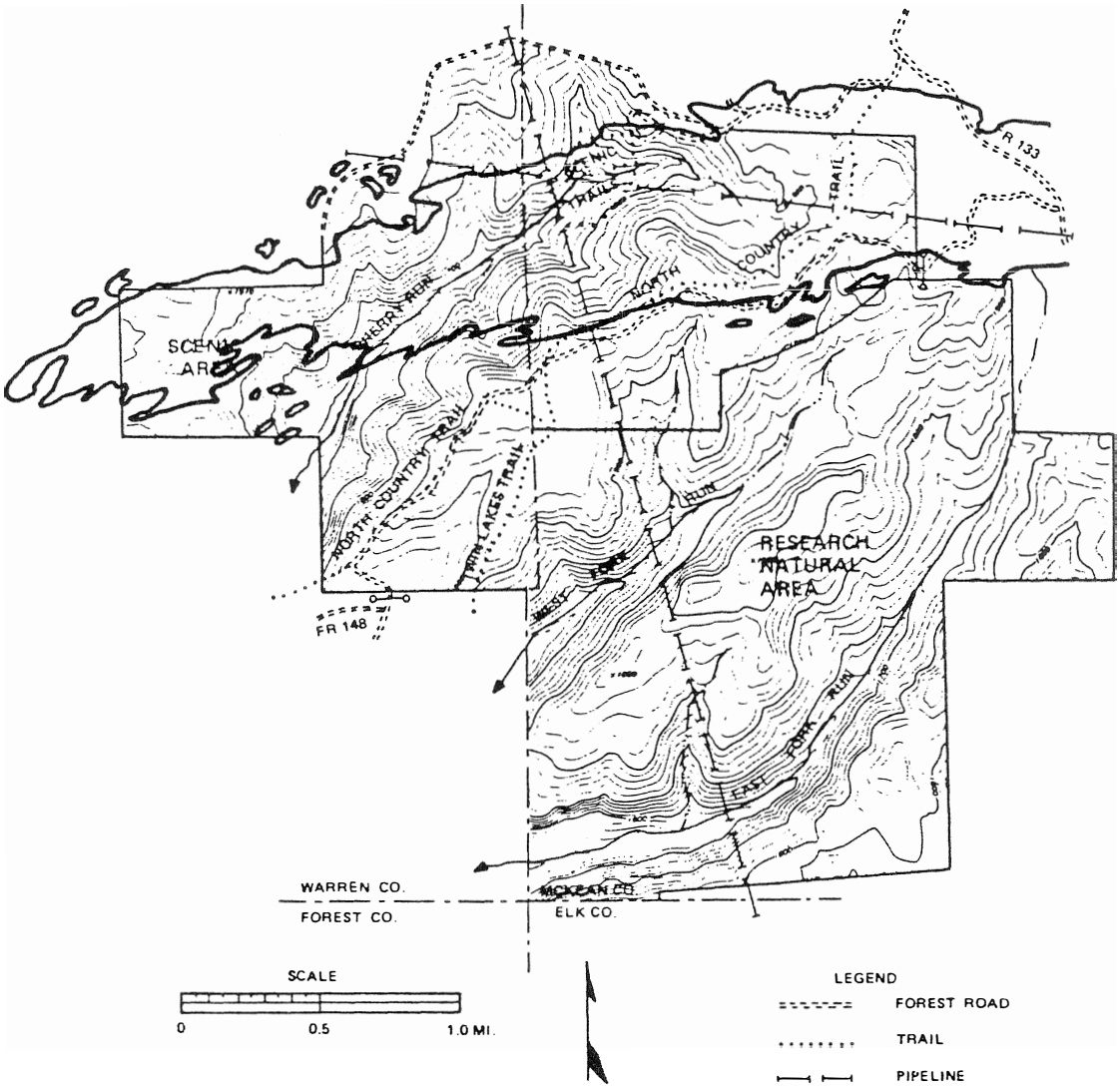

Table 1. Allegheny National Forest, Tionesta Scenic Area and Adjoining Compartments of Sheffield and Ridgway Ranger Districts Species Composition and Volumes for Tornado Blowdown

	WITHIN TORNADO DAMAGED AREA				OUTSIDE TORNADO DAMAGED AREA			
Tree Species	Tionesta Scenic Area		Sheffield Salvage C-104 & C-105		Sheffield TIMIS C-104 & C-105		Ridgway TIMIS C-23, 24 & 25	
Sawtimber	MBF	%	MBF	%	MBF	%	MBF	%
Hemlock	2,104	32.1	2,103	35.4	765	5.9	397	6.2
Y. Poplar	40	0.6	33	0.6	209	1.6	-	-
Y. Birch	156	2.4	154	2.6	623	4.8	-	-
S. Maple	132	2.0	126	2.1	858	6.6	-	-
R. Maple	555	8.5	392	6.6	2,466	19.1	-	-
B. Cherry	963	14.7	589	9.9	5,516	42.7	-	-
W. Ash	97	1.5	59	1.0	479	3.7	-	-
Beech	2,501	38.2	2,482	41.8	2,010	15.6		
Undifferentiated Hardwoods	-	-	-	-	-	-	5,957	93.8
Total	6,548	100	5,937	100	12,926	100	6,354	100
Pulpwood	CCF	%	CCF	%	CCF	%	CCF	%
Total	3,263	100	5,366	100	44,206	100	20,142	100

FOREST INSECTS OF CONCERN

The following background information on forest insects potentially damaging to the various tree species in the Tionesta Scenic Area is presented to give a general idea of what damage could occur by those insects most likely to develop outbreak population densities in the dead and dying trees of the blowdown, and what management practices are available to prevent or reduce such outbreak densities. The forest insects have been arranged by host tree species.

Hemlock

Hemlock borer, *Melanophila fulvoguttata* (Harris)

Kills low vigor and weakened hemlock trees, but does little damage to the wood.

Breeds in weakened, dead and dying trees whose condition develops from defoliation, such as from the Hemlock Looper, fire, windthrow or cutting. Only trees with moist inner bark and cambium provide suitable conditions for development and survival. Pupation occurs in the outer bark, so wood is not damaged. Emergence of mature adults can be completed within one year of attack. Under less suitable conditions where phloem of cut trees becomes too dry, or phloem of live trees remains too moist, either the the life cycle is extended or survival is reduced dramatically.

Management of this beetle to keep it within reasonable population densities involves promoting rapid growth of hemlock or rapidly salvaging damaged or cut trees.

Black Cherry

Shothole borer, *Scolytus rugulosus* (Mueller)

Kills weakened and damaged trees, scoring sapwood.

Prefers trees with drying phloem to construct its galleries parallel with the wood grain. Breeds in weakened and dying or cut black cherry. Pupation occurs in the cambium and sapwood. Because this beetle produces up to two generations per year, it has a high potential for rapidly increasing population density when suitable host material is abundant.

Proper management to reduce the potential of population buildup involves prompt removal of black cherry logs as well as dead, broken tops and dying, windthrown, or snapped trees.

Perch bark beetle, Phloeotribus liminaris (Harris)

Kills small trees under stress from defoliation or poor sites, and causes degrading gumosis in sawtimber and veneer sized trees.

Breeds in weakened black cherry trees stressed by defoliation, such as from the Cherry Scallop Shell Moth or windthrown trees with root contact with the soil. Prefers trees with moist phloem in which to construct its galleries across the wood grain. Adults burrow into the inner bark of living cherry trees to overwinter and thereby cause irritation and gum flow resulting in gumosis and gum pockets.

Management practices to reduce the damage caused by this species are limited to circumstances where there are large concentrations of weakened trees. Windthrown trees maintaining enough root contact with the soil to keep themselves alive provide just such a situation.

Beech

Flathead apple tree borer, Chrysobothris femorata (Olivier)

Kills primarily small diameter trees under stress.

Breeds in beech weakened by drought, defoliation and windthrow to complete one generation each year. Pupates in the inner bark. Prefers living trees in which large meandering galleries are constructed in the outer sapwood which girdle and kill large patches of bark but only kill smaller diameter trees directly.

Management actions involve keeping trees growing vigorously especially in the younger age classes.

Twolined chestnut borer, Agrilus bilineatus (Weber)

Kills all sizes of living trees under stress.

Breeds in beech trees preferring live trees stressed by defoliation, drought or wind damage, completing a generation every two years. Live trees are effectively girdled by the lengthy, meandering galleries this species constructs under in the inner bark, thereby scarring the wood. Pupates in the inner bark. Dead trees are not suitable for the development of this species.

Management action to prevent this species from building to high densities are limited to maintaining vigorous tree growth.

Red Maple and All Tree Species Present

Ambrosia beetles, Scolytidae.

Attacks dying trees, entering the heartwood and causing defects and discolorations which result in degrade to sawtirber and veneer sized trees.

Numerous species, all quite specific as to their host, pose a very great threat to the value of trees through the degrade of veneer and sawtimber. All species bore into the wood where they introduce a fungus whose tissues provide the food for the developing larvae. Because fungal growth is essential for feeding their young, these species attack damaged to dying trees and felled timber while their moisture content is quite high. Once the damaged trees or cut logs season, the threat of these beetles diminishes rapidly.

Certain species are worth noting for their preference for hosts damaged within the Tionesta Scenic Area:

Columbian timber beetle, Corthylus columbianus Hopkins
Miscellaneous ambrosia beetles, Xyloterinus politus (Say) and
Xyleborus species

Prompt removal of susceptible trees and rapid air drying of logs are about the only way that damage from these beetles can be reduced.

Because the tornado damage occurred in late May, the remainder of the warm season provided time for most, if not all, of the insects mentioned earlier to attack the damaged trees and completed part or all of their life cycle. The damage resulting from this attack and feeding has probably appreciably reduced the grade of the larger diameter sawtimber and veneer quality trees. However, since the majority of these trees are hemlock or American beech, rather than the higher-valued species such as black cherry, white ash and sugar maple, the total value loss would appear to be small.

Furthermore, the insects breeding in the tornado damaged tree species would pose only a small threat to the standing timber nearby because of the large differences in species composition and size classes between the blowdown and the live, standing trees.